

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Canceled)

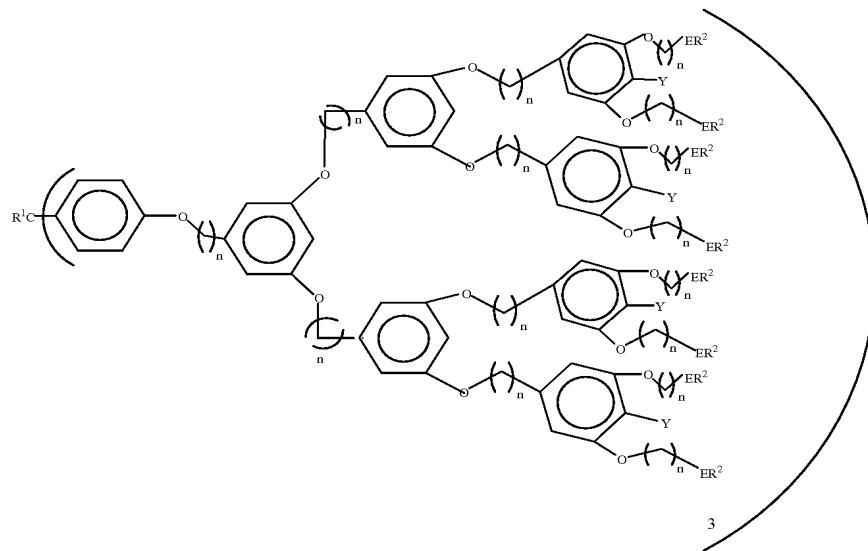
2. (Currently Amended) The coating composition according to claim 1 claim 4, wherein the sol-gel matrix is a sol-gel processed xerogel.

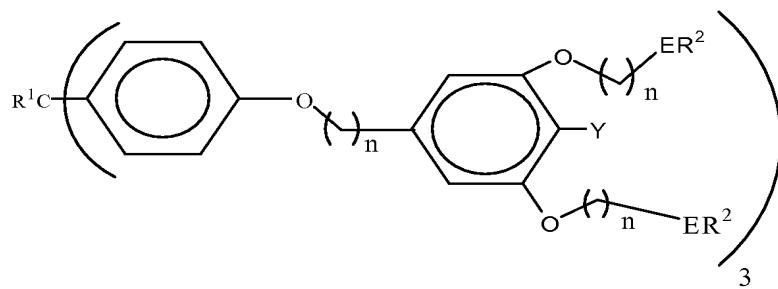
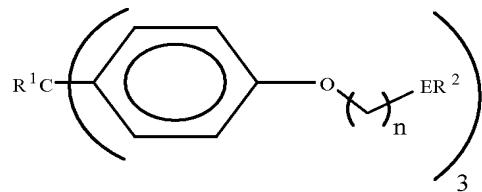
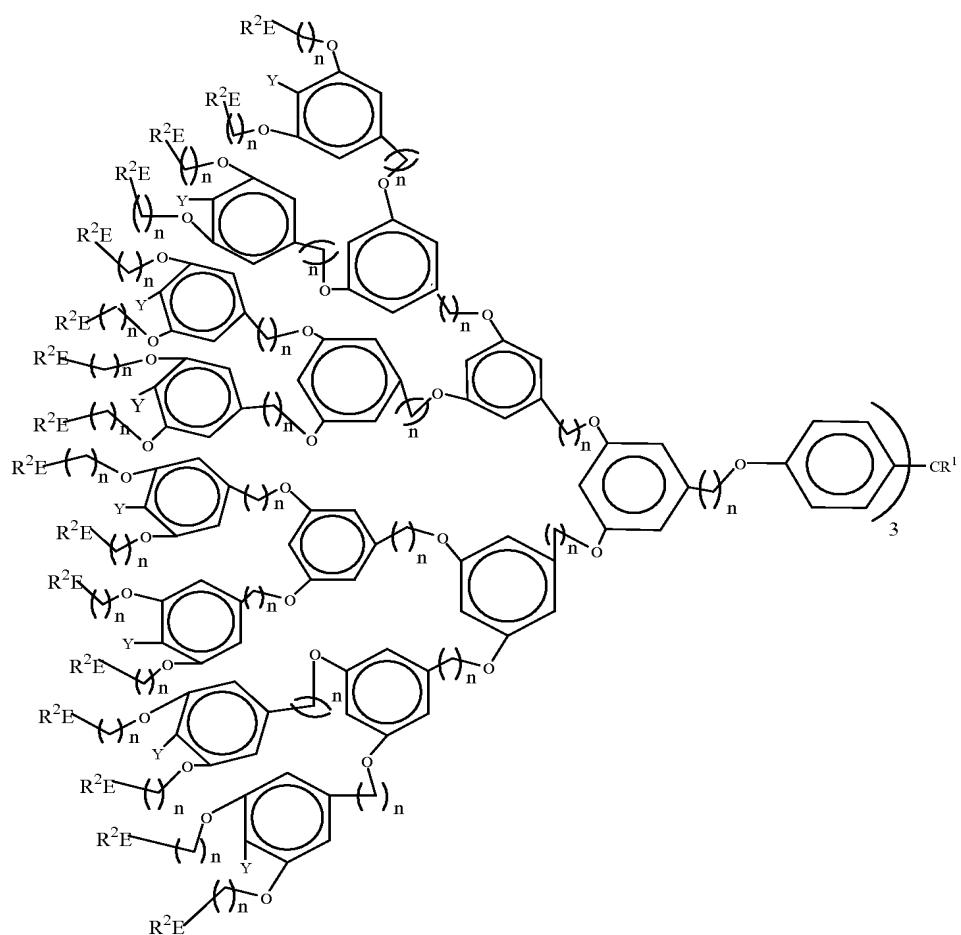
3. (Original) The coating composition according to claim 2, wherein the xerogel is formed from doped or undoped tetramethylorthosilane, doped or undoped tetraethylorthosilane, hybrid *n*-propyl-trimethoxysilane/tetramethylorthosilane, hybrid bis[3-(trimethoxysilyl)propyl]ethylenediamine/ tetraethylorthosilane, hybrid tetramethylorthosilane/*n*-propyl-trimethoxysilane/bis[3-(trimethoxysilyl)propyl]ethylenediamine), or hybrid tetramethylorthosilane /*n*-octyl-triethoxysilane.

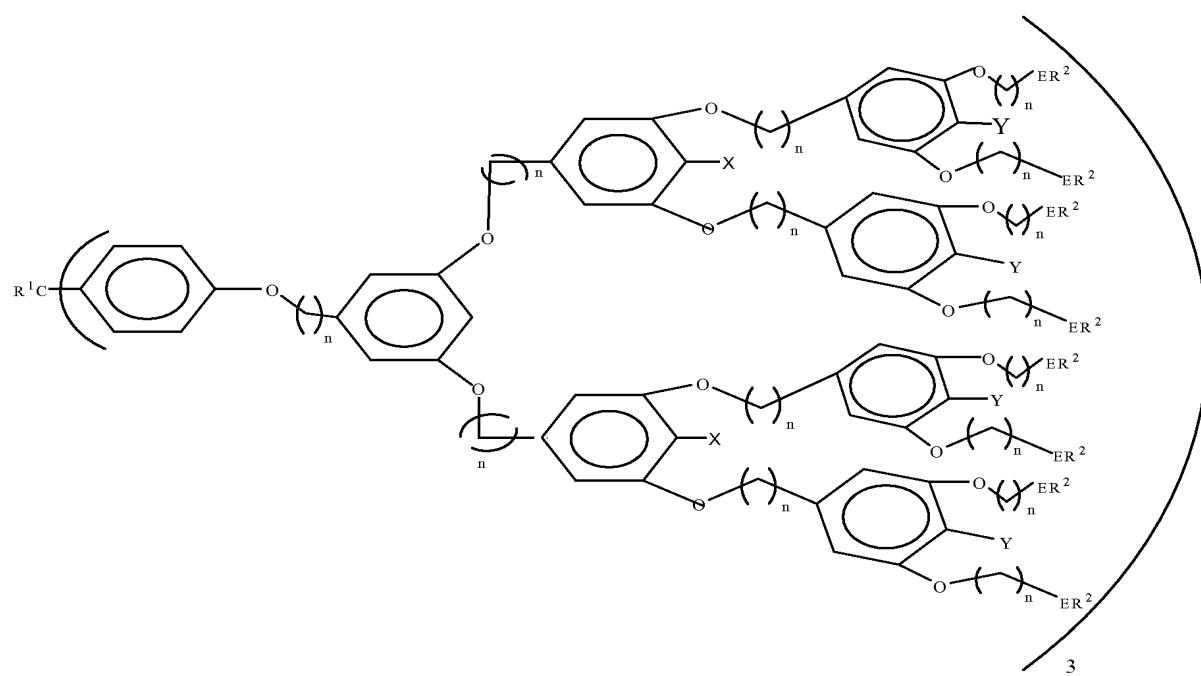
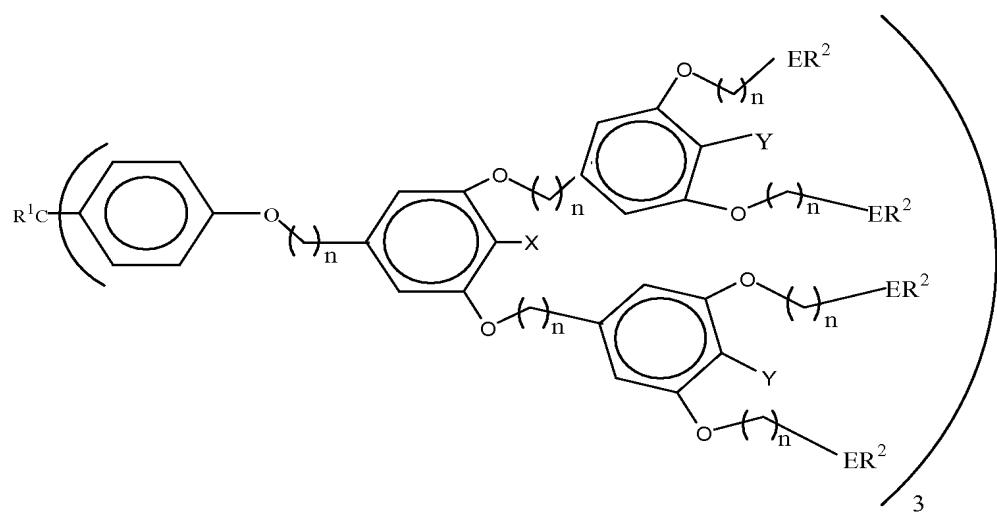
4. (Currently Amended) ~~The coating composition according to claim 1 A~~ coating composition comprising:

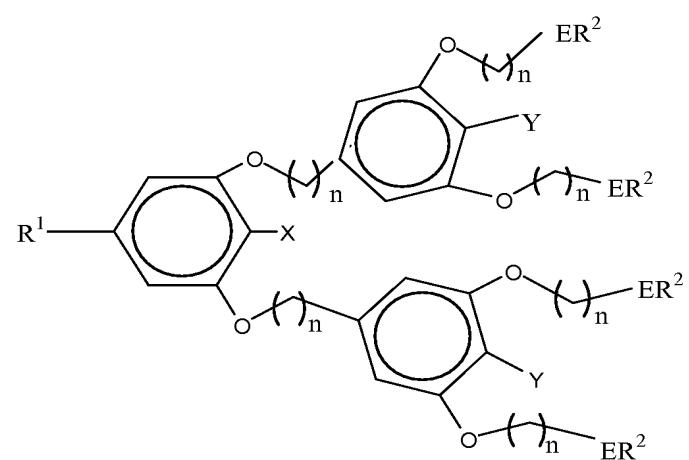
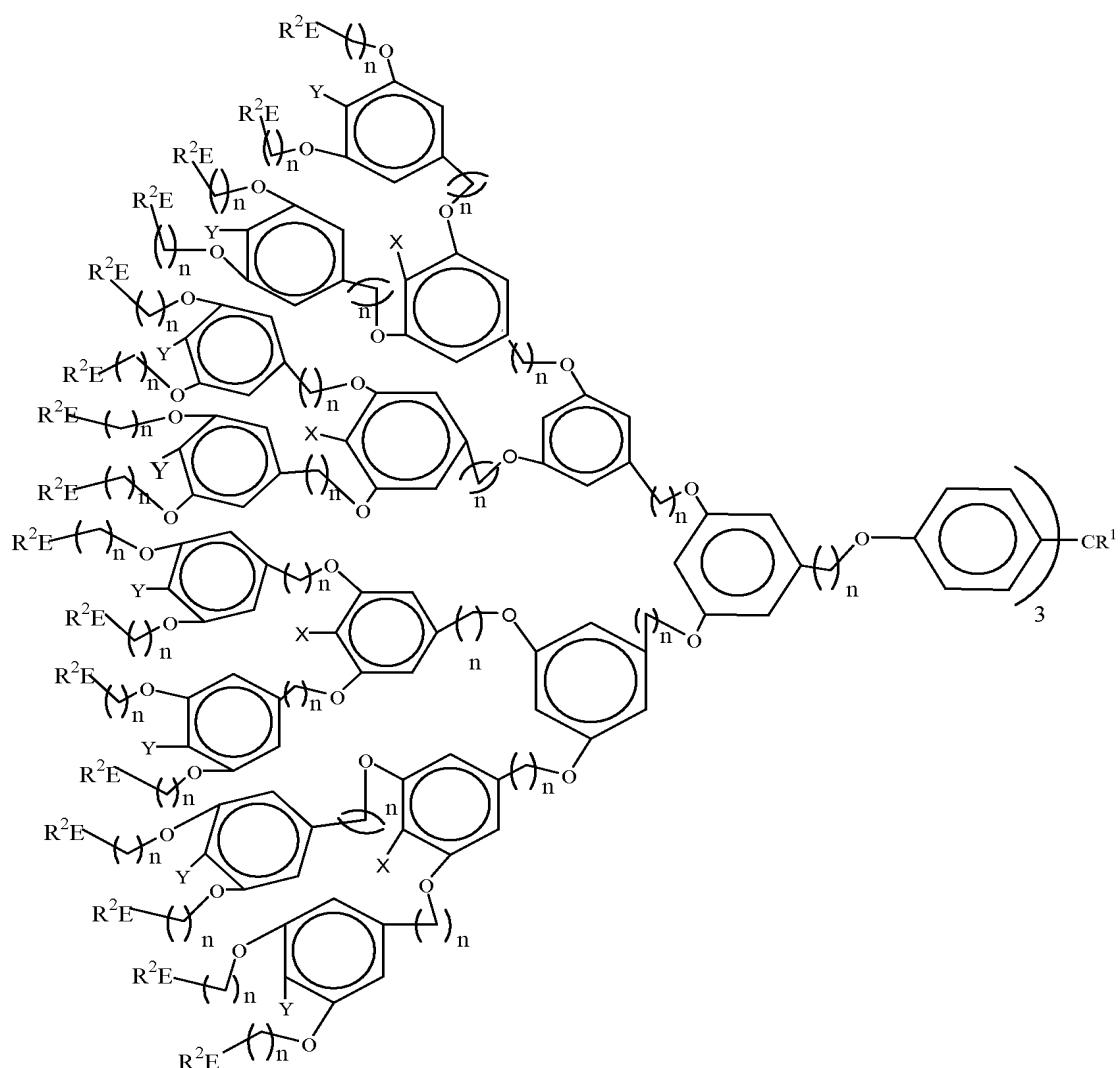
a sol-gel matrix and

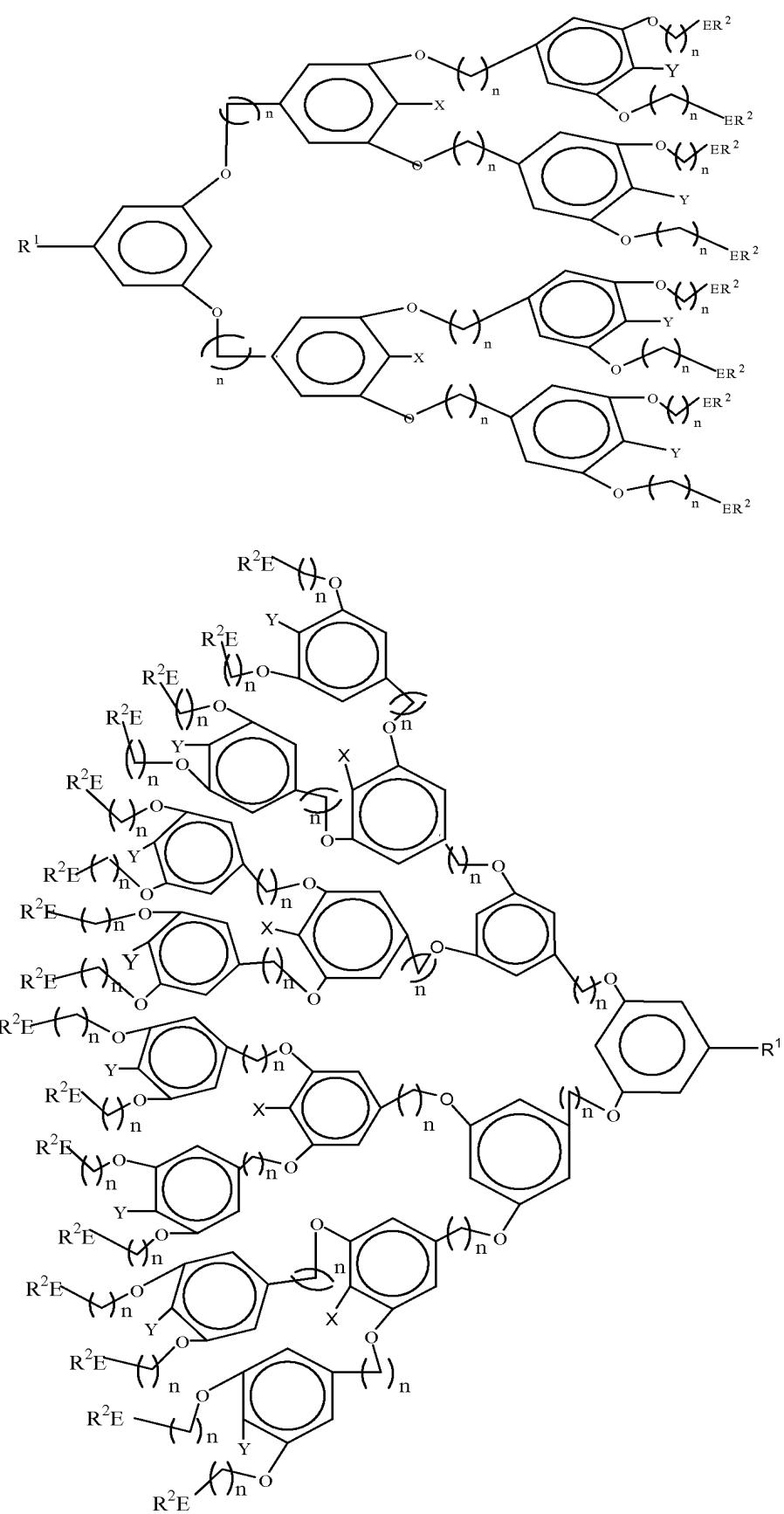
a dendrimeric organochalcogeno derivative bound to at least a portion of the sol-gel matrix, wherein the dendrimeric organochalcogeno derivative has the formula:

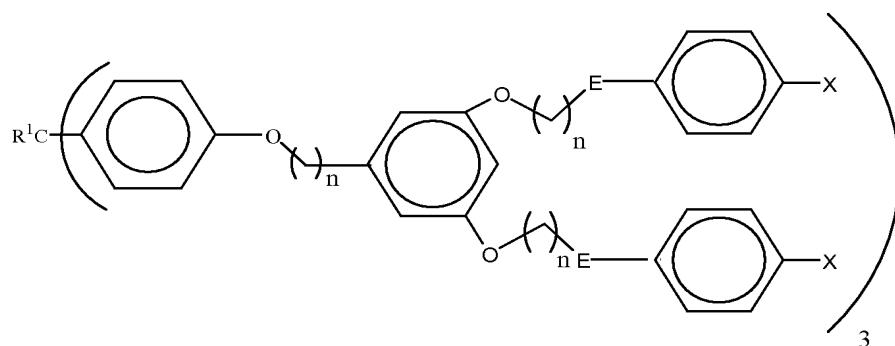




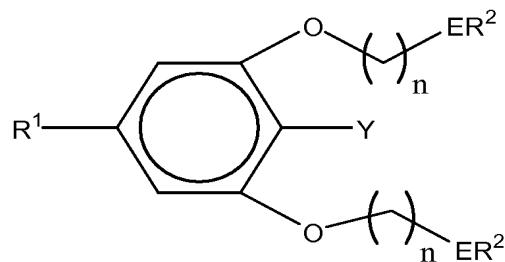




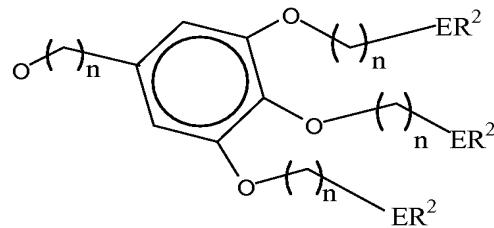




or



wherein each Y individually is H or $O(CH_2)_nER^2$,
 each X individually is H, $N((CH_2)_nCO_2Na)_2$ or



R^1 is a substituted or unsubstituted, straight or branched chain C1-C10 alkyl group, a substituted or unsubstituted, straight or branched chain C1-C10 alkenyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heteroaryl group,

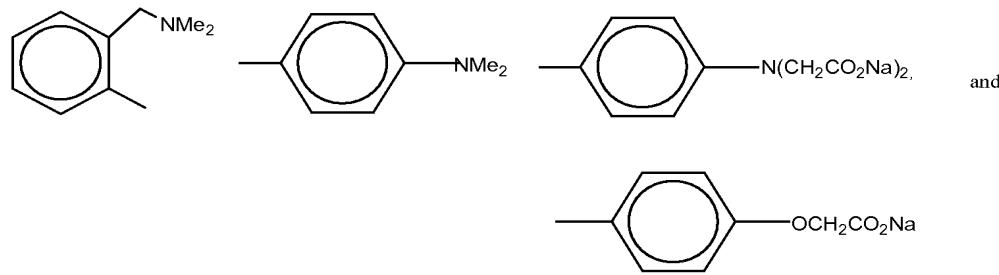
each E individually is a chalcogen,

each R^2 individually is a substituted or unsubstituted, straight or branched chain C1-C16 alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heteroaryl group, an ethylene glycol oligomer, or a perfluoroalkyl group, and

each n individually is an integer from 1 to 16.

5. (Original) The coating composition according to claim 4, wherein ER^2 is selected from the group consisting of EPh, 4-($CH_3)_2C_6H_4E$, 4-($CH_3)_2NC_6H_4E$, 4-HOC $_6H_4E$, 4-($CH_3O_2CCH_2)_2NC_6H_4E$, 4-($NaO_2CCH_2)_2NC_6H_4E$, 4-(HOCH $_2CH_2)_2NC_6H_4E$, and 4-($NaO_2CCH_2O)C_6H_4E$.

6. (Original) The coating composition according to claim 4, wherein R^2 is selected from the group consisting of phenyl, $n-C_6H_{13}$,



7. (Currently Amended) The coating composition according to ~~claim 4~~ ~~claim 4~~, wherein the dendrimeric organochalcogeno derivative is non-covalently bound to at least a portion of the sol-gel matrix.

8. (Currently Amended) The coating composition according to ~~claim 4~~ ~~claim 4~~, wherein the dendrimeric organochalcogeno derivative is covalently bound to at least a portion of the sol-gel matrix.

9. (Currently Amended) The coating composition according to ~~claim 4~~ ~~claim 4~~, wherein from about 0.1 wt.% to about 5 wt.% of the dendrimeric organochalcogeno derivative is bound to the sol-gel matrix.

10. (Canceled)

11. (Currently Amended) The system according to ~~claim 10~~ ~~claim 13~~, wherein the sol-gel matrix is a sol-gel processed xerogel.

12. (Original) The system according to claim 11, wherein the xerogel is formed from doped or undoped tetramethylorthosilane, doped or undoped tetraethylorthosilane, hybrid *n*-propyl-trimethoxysilane/tetramethylorthosilane, hybrid bis[3-(trimethoxysilyl)propyl]ethylenediamine/ tetraethylorthosilane, hybrid tetramethylorthosilane/*n*-propyl-trimethoxysilane/bis[3-(trimethoxysilyl)propyl]ethylenediamine), or hybrid tetramethylorthosilane /*n*-octyl-triethoxysilane.

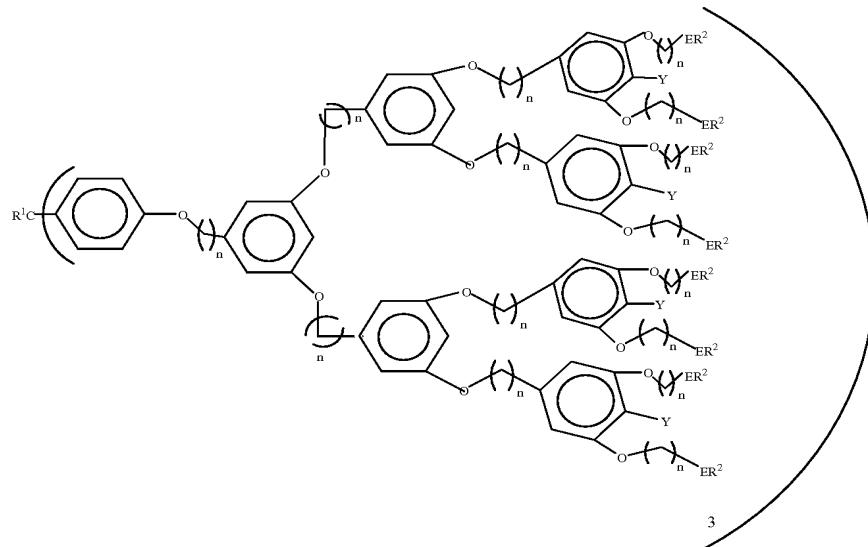
13. (Currently Amended) ~~The system according to claim 10 A system comprising:~~

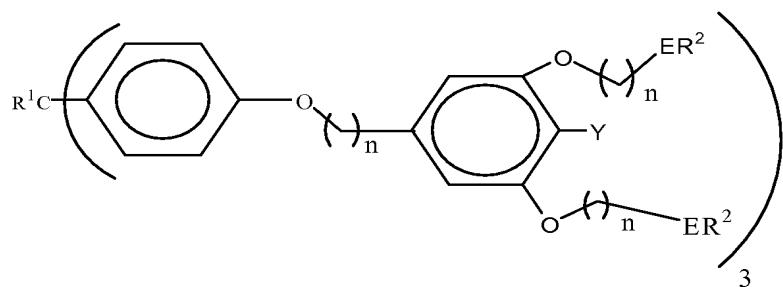
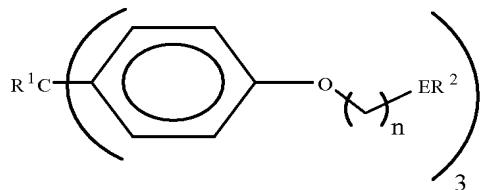
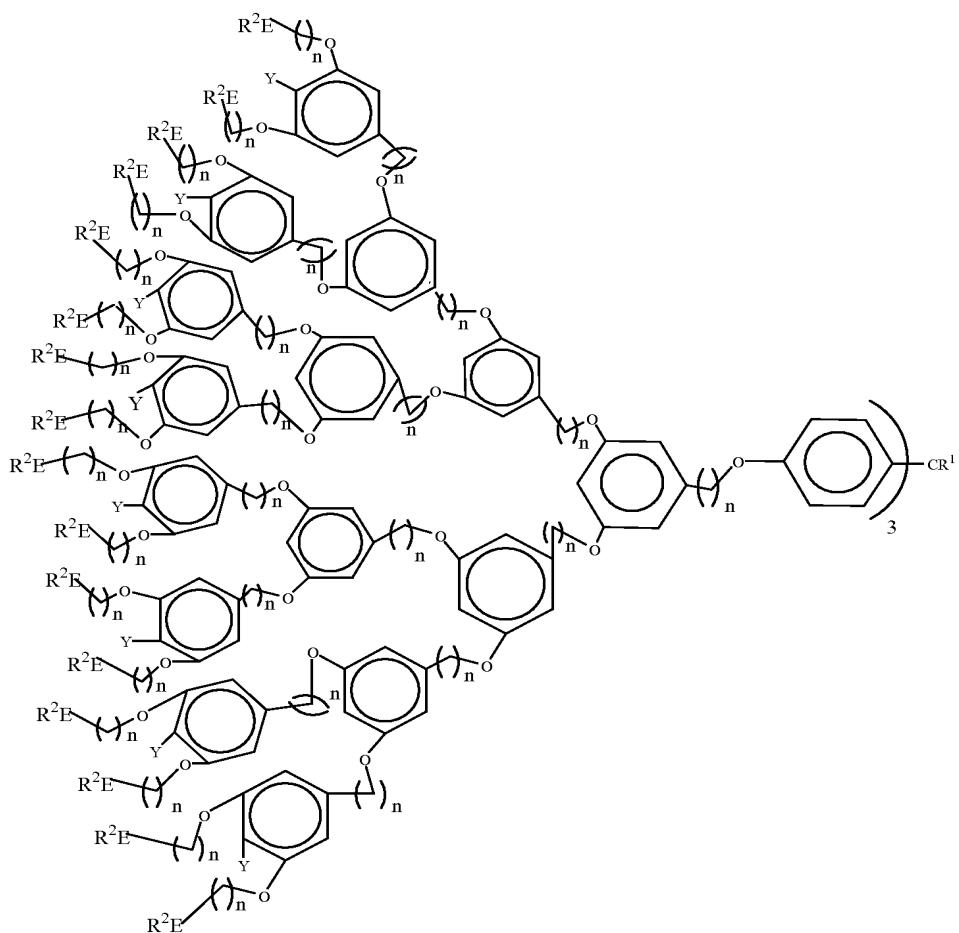
a coating composition comprising

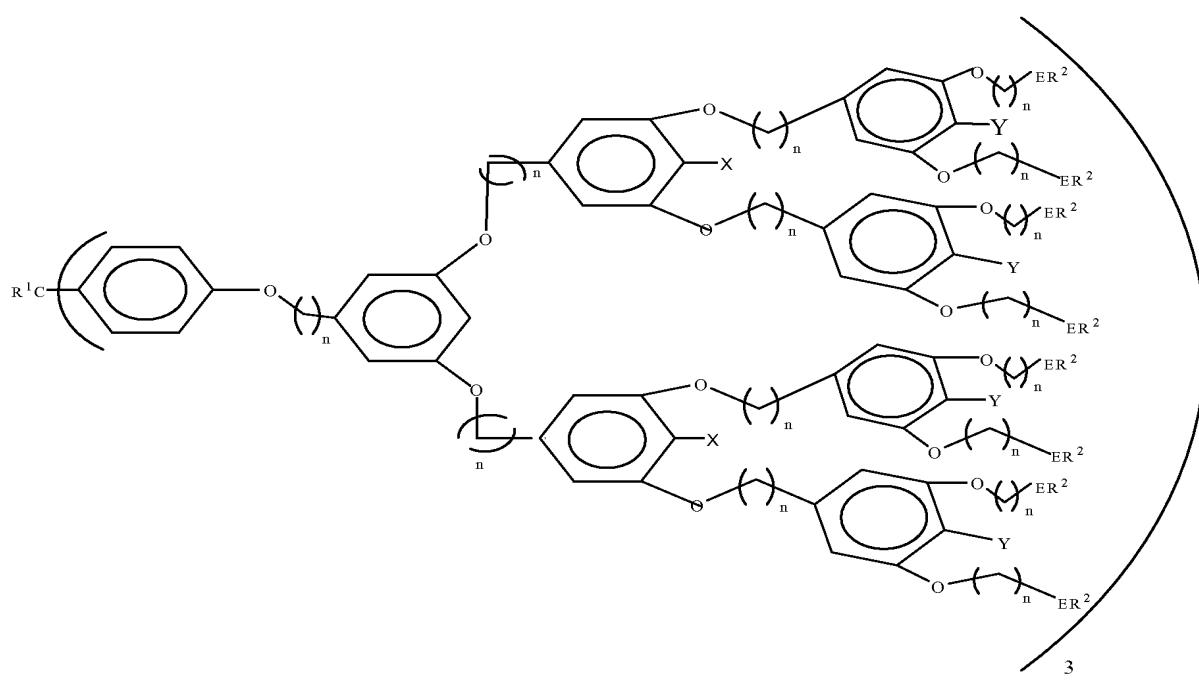
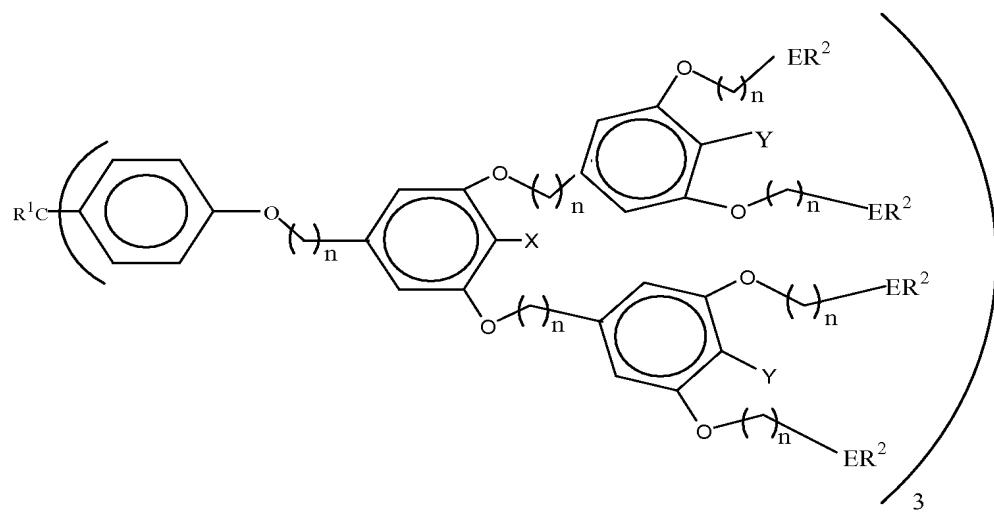
a sol-gel matrix and

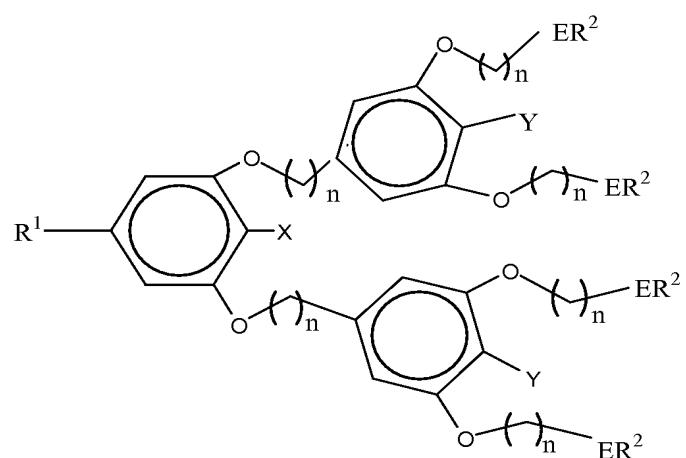
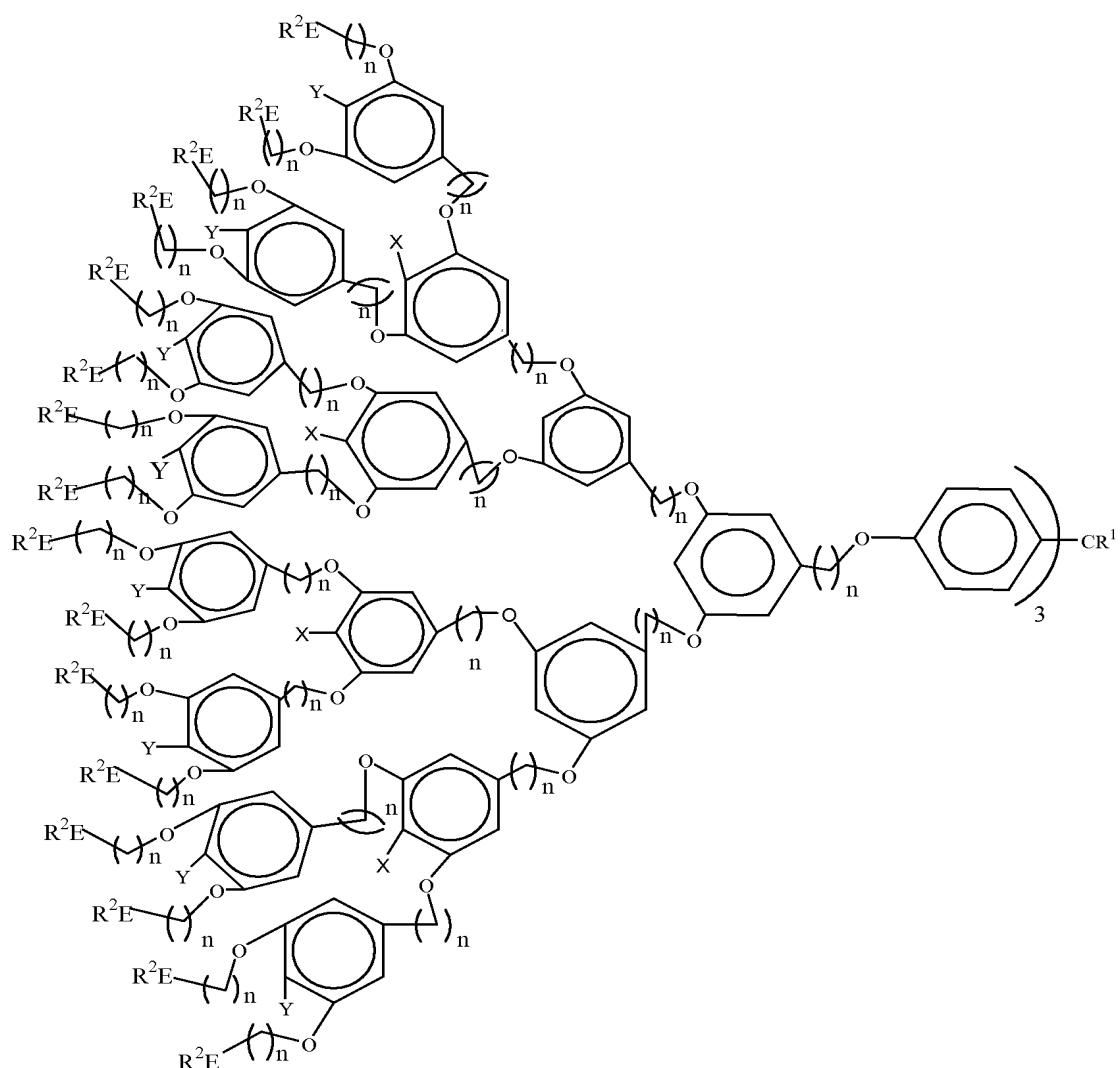
a dendrimeric organochalcogeno derivative bound to at least a portion of the sol-gel matrix, and

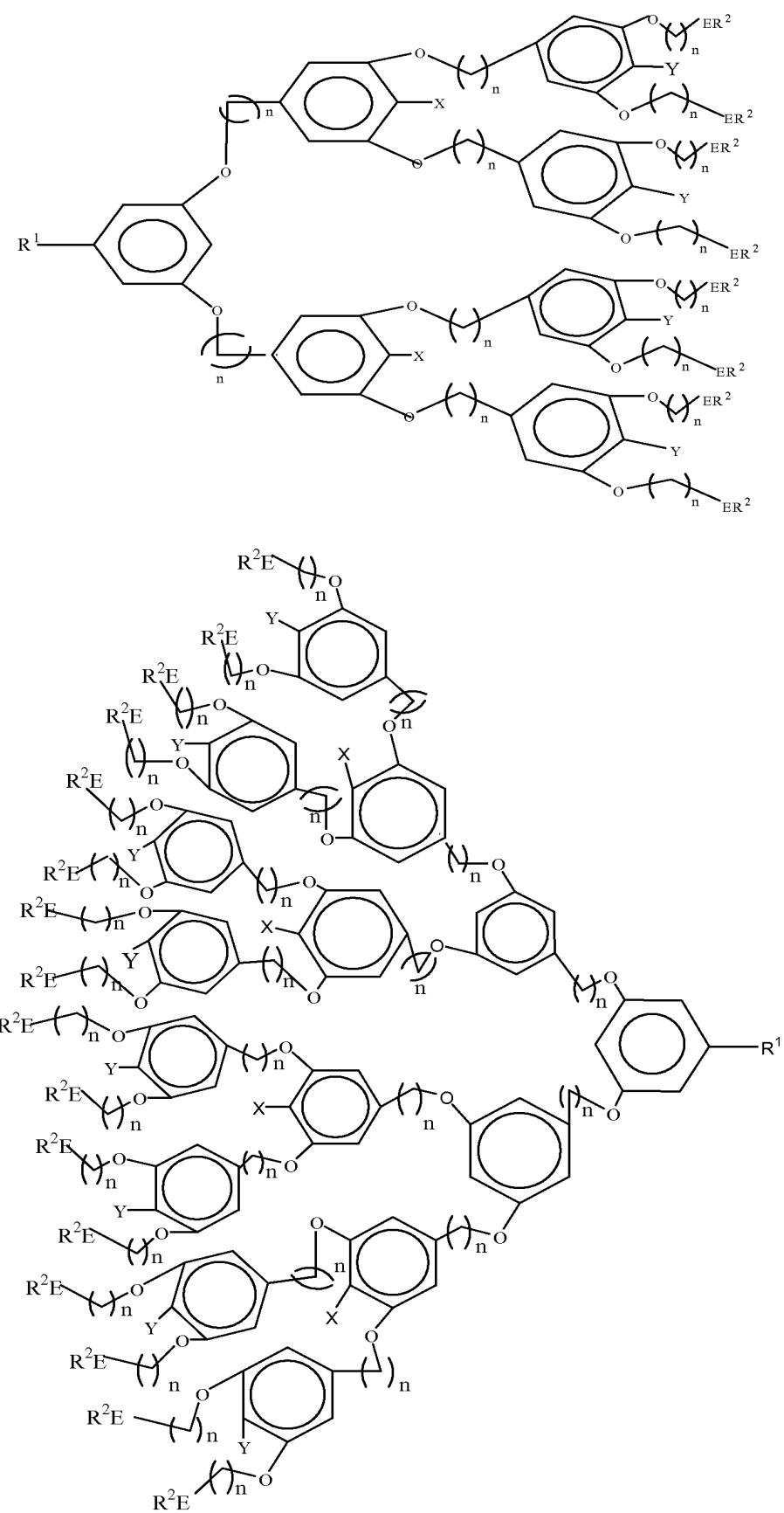
a substrate, wherein at least a portion of the substrate is coated with the coating composition, wherein the dendrimeric organochalcogeno derivative has the formula:

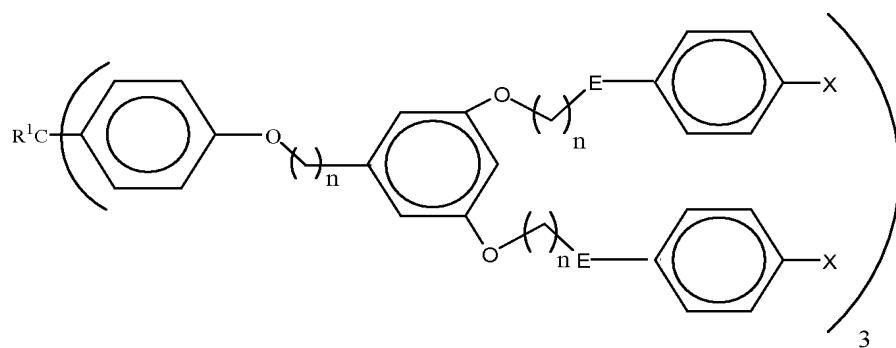




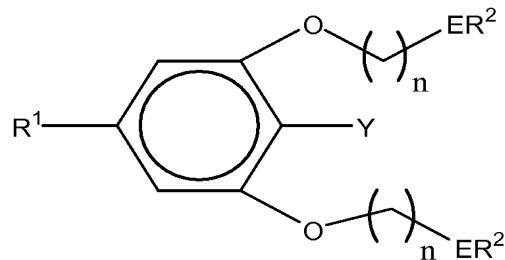




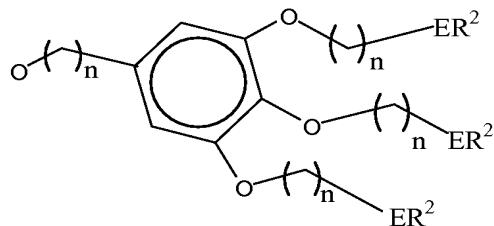




or



wherein each Y individually is H or $O(CH_2)_nER^2$,
 each X individually is H, $N((CH_2)_nCO_2Na)_2$ or



R^1 is a substituted or unsubstituted, straight or branched chain C1-C10 alkyl group, a substituted or unsubstituted, straight or branched chain C1-C10 alkenyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heteroaryl group,

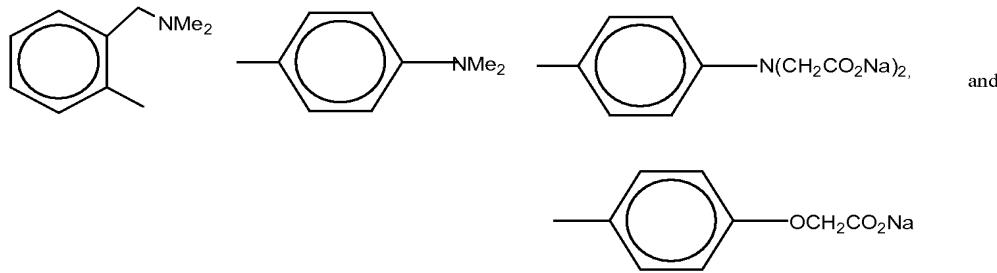
each E individually is a chalcogen,

each R^2 individually is a substituted or unsubstituted, straight or branched chain C1-C16 alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heteroaryl group, an ethylene glycol oligomer, or a perfluoroalkyl group, and

each n individually is an integer from 1 to 16.

14. (Original) The system according to claim 13, wherein ER^2 is selected from the group consisting of EPh, 4-(CH_3)₂C₆H₄E, 4-(CH_3)₂NC₆H₄E, 4-HOC₆H₄E, 4-($CH_3O_2CCH_2$)₂NC₆H₄E, 4-(NaO₂CCH₂)₂NC₆H₄E, 4-(HOCH₂CH₂)₂NC₆H₄E, and 4-(NaO₂CCH₂O)C₆H₄E.

15. (Original) The system according to claim 13, wherein R^2 is selected from the group consisting of phenyl, n -C₆H₁₃,



16. (Currently Amended) The system according to ~~claim 10~~ claim 13, wherein the dendrimeric organochalcogeno derivative is non-covalently bound to at least a portion of the sol-gel matrix.

17. (Currently Amended) The system according to ~~claim 10~~ claim 13, wherein the dendrimeric organochalcogeno derivative is covalently bound to at least a portion of the sol-gel matrix.

18. (Currently Amended) The system according to ~~claim 10~~ claim 13, wherein from about 0.1 wt% to about 5 wt.% of the dendrimeric organochalcogeno derivative is bound to the sol-gel matrix.

19. (Currently Amended) The system according to ~~claim 10~~ claim 13, wherein the substrate is selected from the group consisting of metals, plastics, glass, and wood.

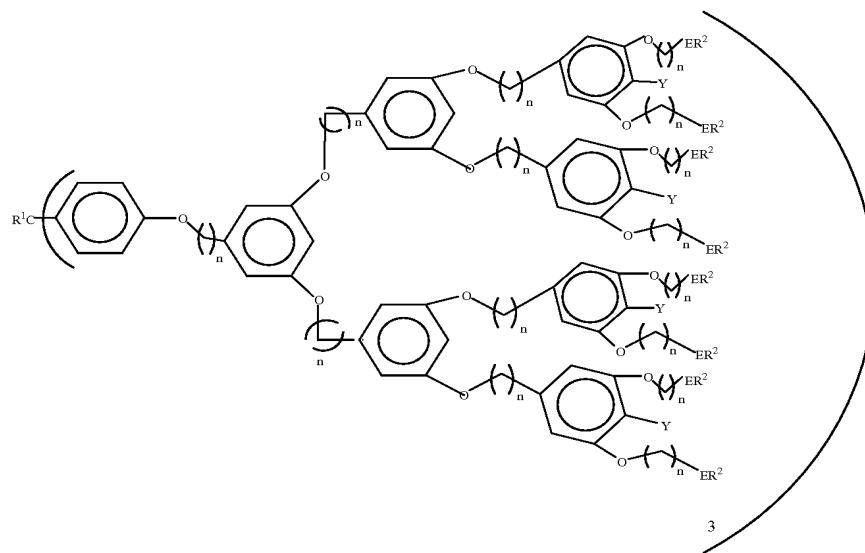
20. (Canceled)

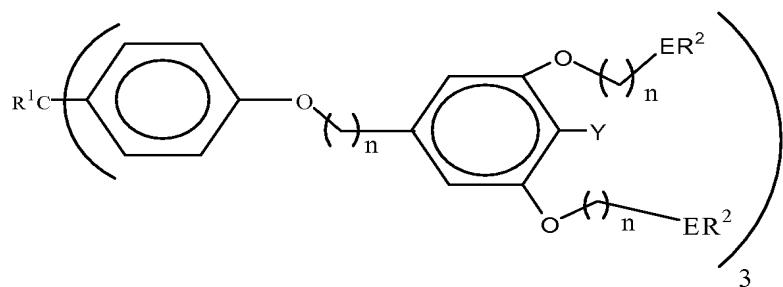
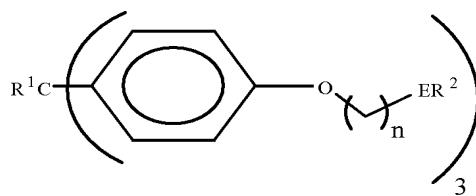
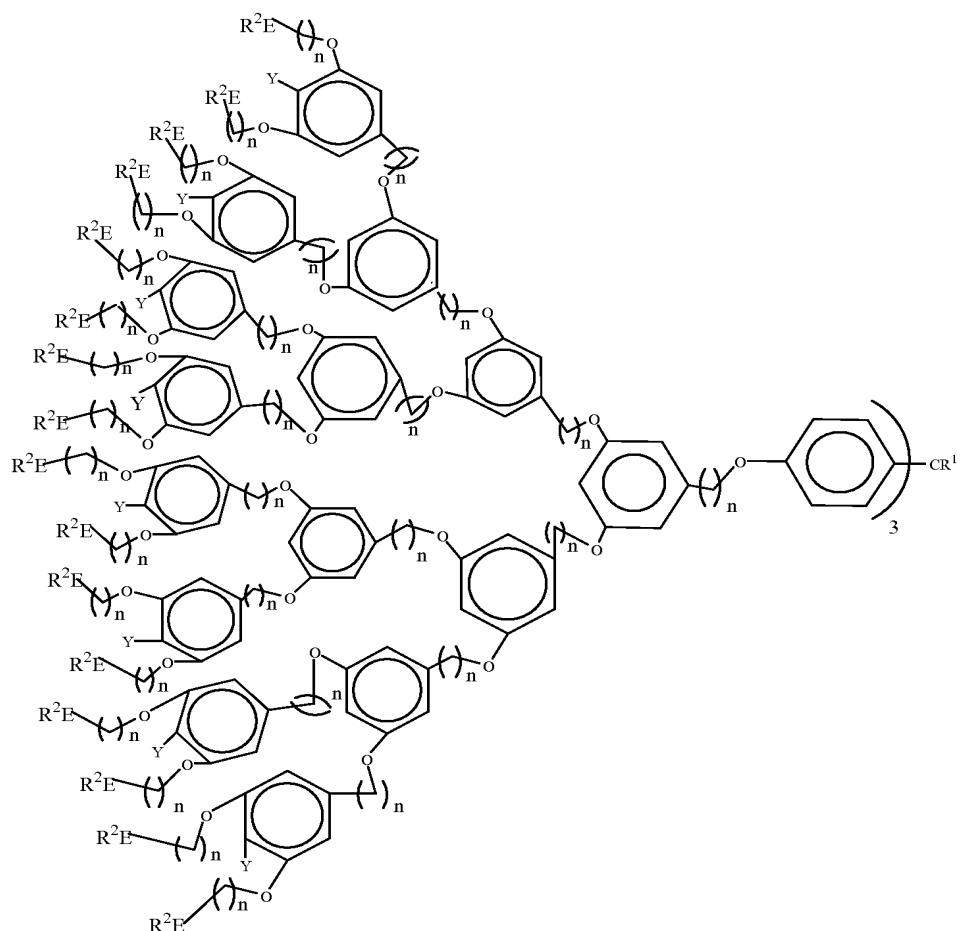
21. (Currently Amended) The method according to ~~claim 20~~ claim 24, wherein the sol-gel matrix is a sol-gel processed xerogel.

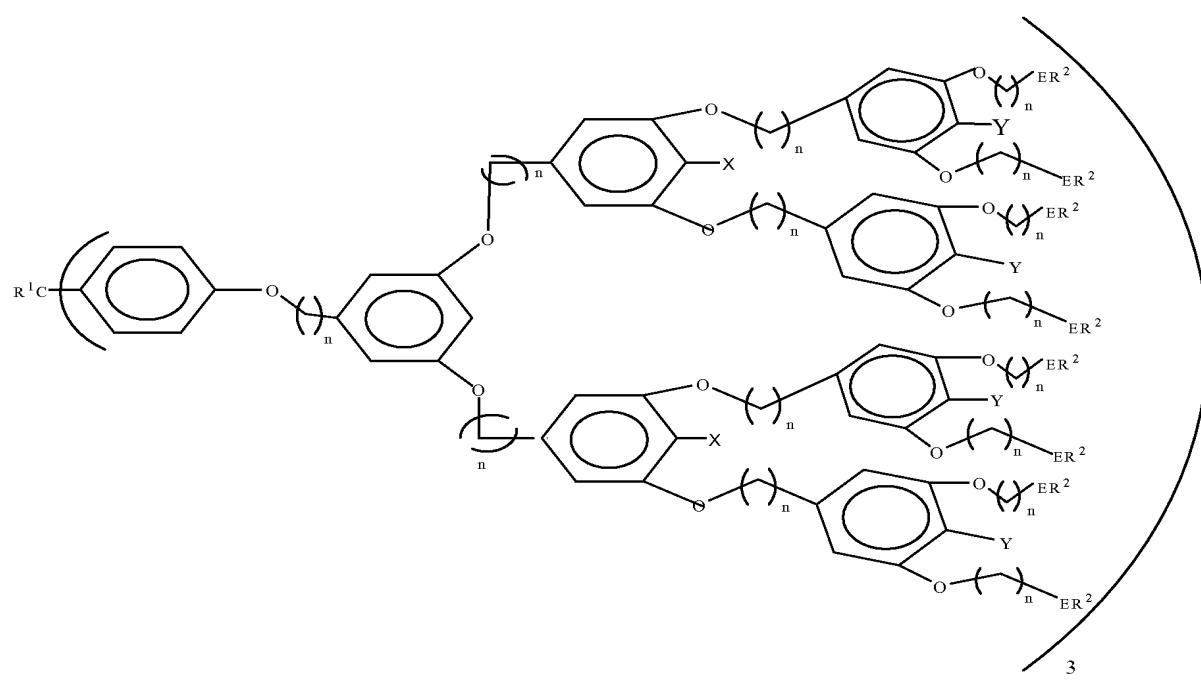
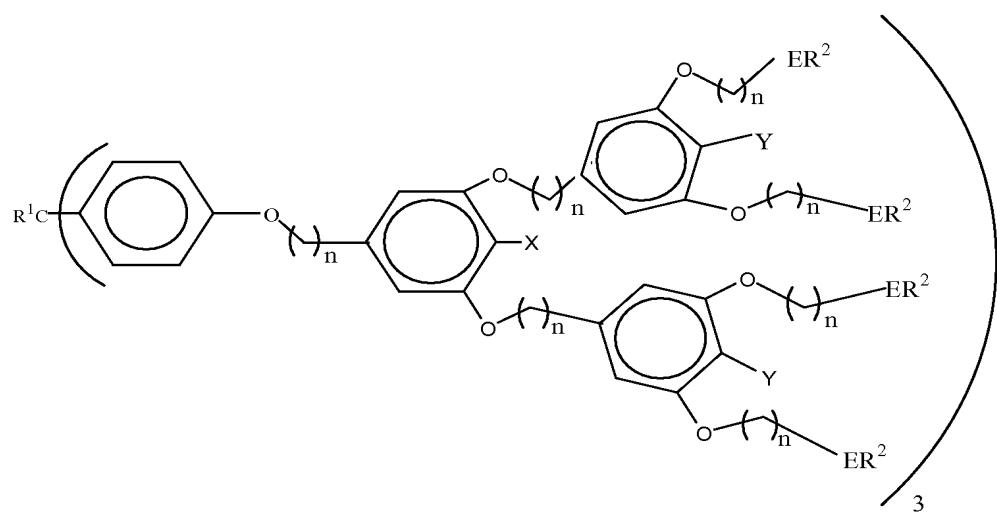
22. (Original) The method according to claim 21, wherein the xerogel is formed from doped or undoped tetramethylorthosilane, doped or undoped tetraethylorthosilane, hybrid *n*-propyl-trimethoxysilane/tetramethylorthosilane, hybrid bis[3-(trimethoxysilyl)propyl]ethylenediamine)/ tetraethylorthosilane, hybrid tetramethylorthosilane/*n*-propyl-trimethoxysilane/bis[3-(trimethoxysilyl)propyl]ethylenediamine), or hybrid tetramethylorthosilane /*n*-octyl-triethoxysilane.

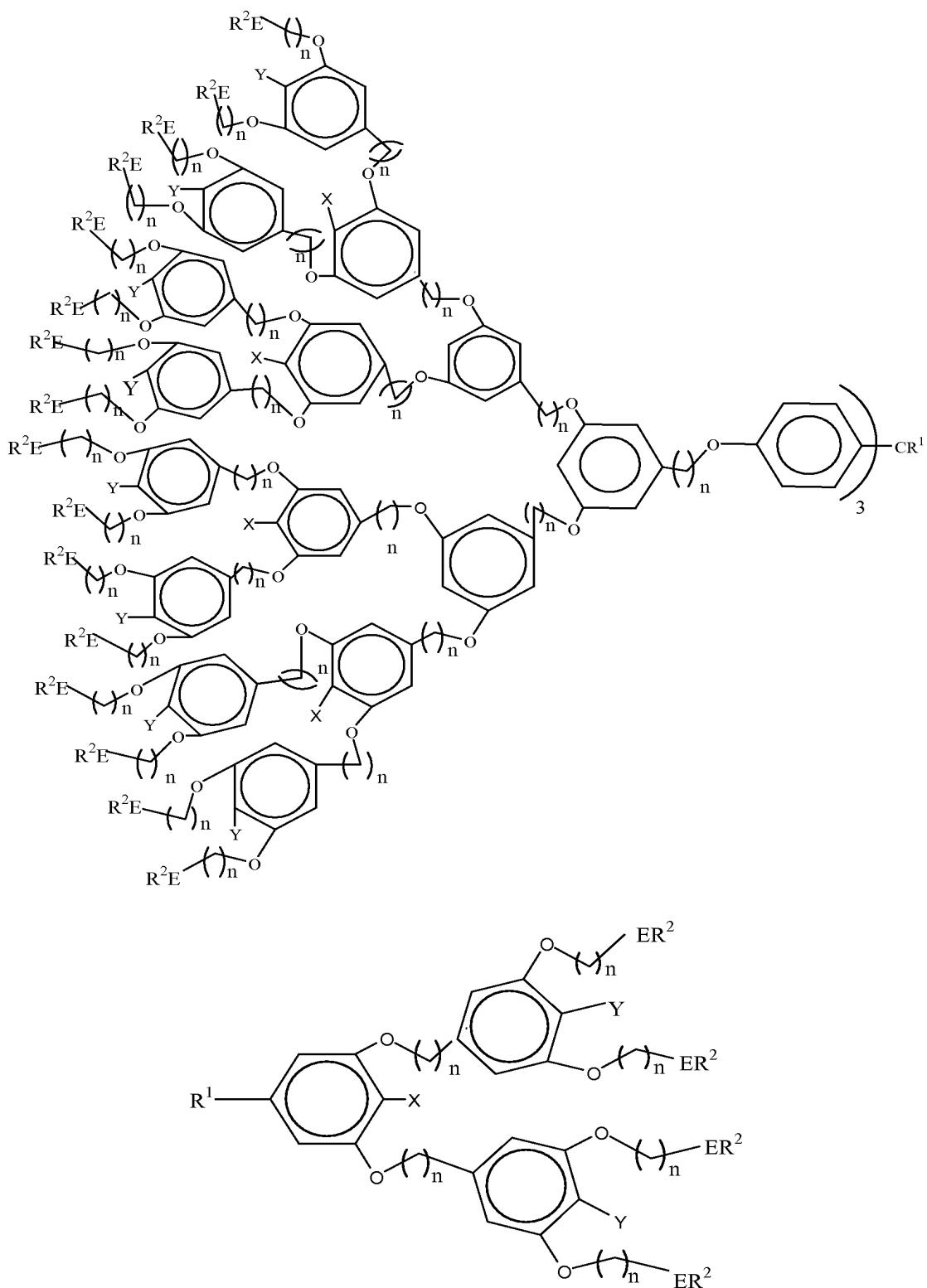
23. (Canceled)

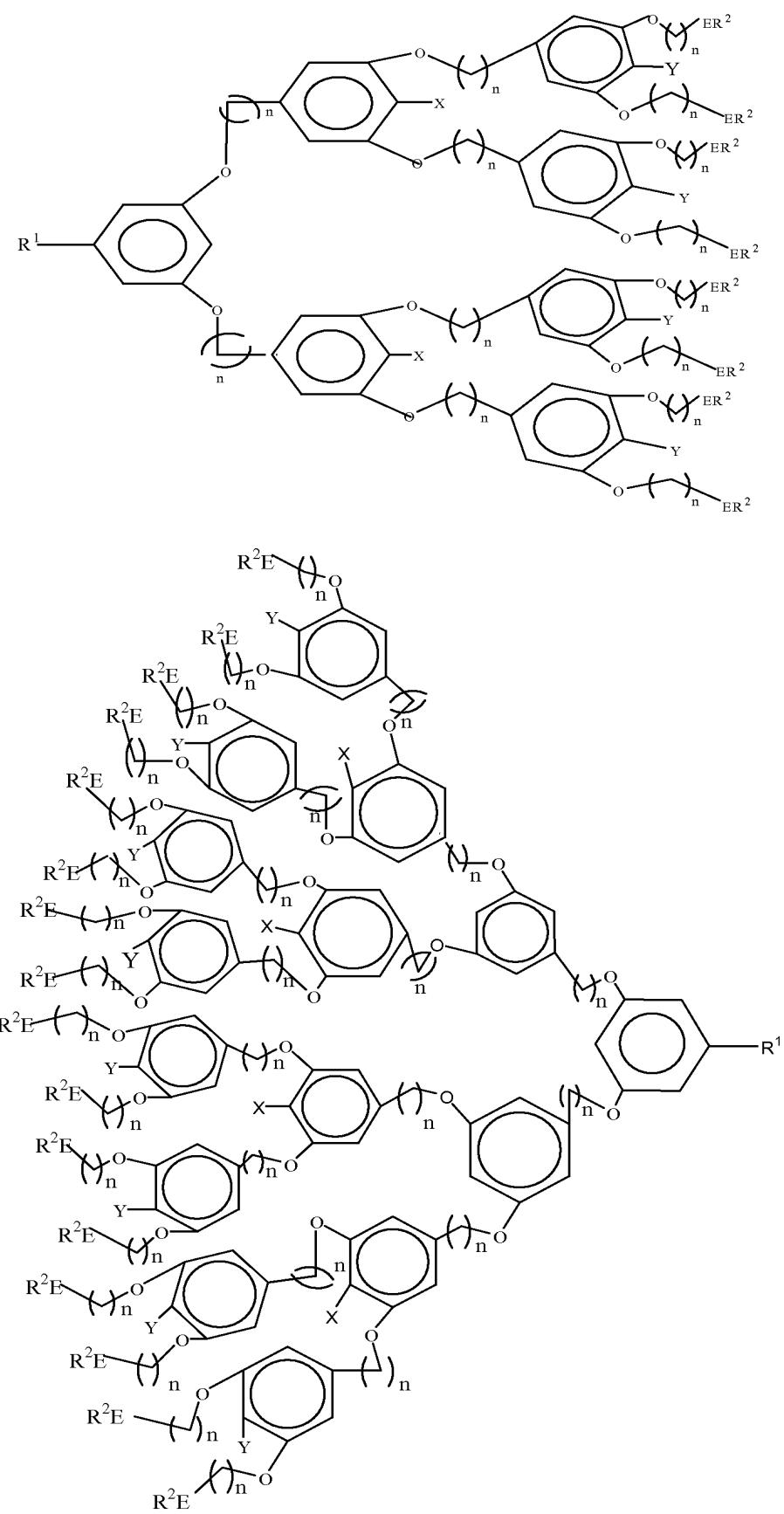
24. (Currently Amended) The method according to claim 23 A method of preventing fouling of surfaces subjected to a marine environment, said method comprising:
providing a coating composition comprising:
a sol-gel matrix and
a dendrimeric organochalcogeno derivative bound to at least a portion
of the sol-gel matrix, and
applying the coating composition to a surface subjected to a marine
environment under conditions effective to prevent or reduce fouling of the surface, wherein
the dendrimeric organochalcogeno derivative has the formula:

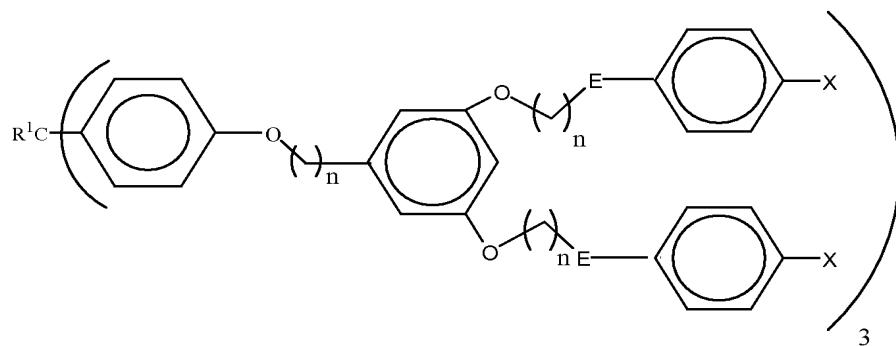




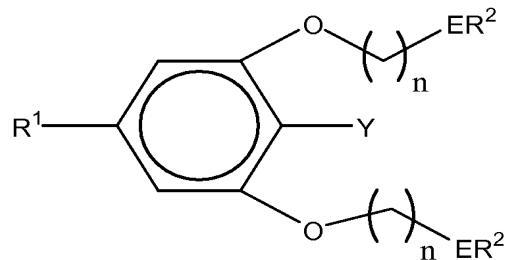




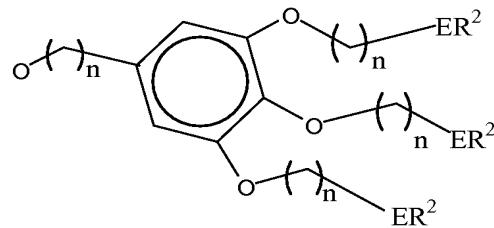




or



wherein each Y individually is H or $O(CH_2)_nER^2$,
 each X individually is H, $N((CH_2)_nCO_2Na)_2$ or



R^1 is a substituted or unsubstituted, straight or branched chain C1-C10 alkyl group, a substituted or unsubstituted, straight or branched chain C1-C10 alkenyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heteroaryl group,

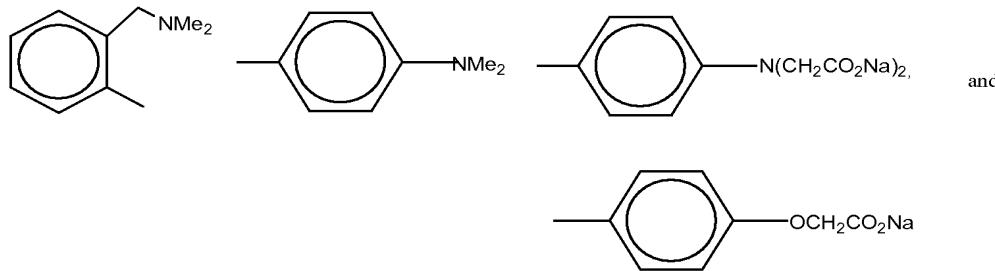
each E individually is a chalcogen,

each R^2 individually is a substituted or unsubstituted, straight or branched chain C1-C16 alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heteroaryl group, an ethylene glycol oligomer, or a perfluoroalkyl group, and

each n individually is an integer from 1 to 16.

25. (Original) The method according to claim 24, wherein ER^2 is selected from the group consisting of EPh, 4-(CH_3)₂C₆H₄E, 4-(CH_3)₂NC₆H₄E, 4-HOC₆H₄E, 4-($CH_3O_2CCH_2$)₂NC₆H₄E, 4-(NaO₂CCH₂)₂NC₆H₄E, 4-(HOCH₂CH₂)₂NC₆H₄E, and 4-(NaO₂CCH₂O)C₆H₄E.

26. (Original) The method according to claim 24, wherein R^2 is selected from the group consisting of phenyl, *n*-C₆H₁₃,



27. (Currently Amended) The method according to ~~claim 23~~ claim 24, wherein the dendrimeric organochalcogeno derivative is non-covalently bound to at least a portion of the sol-gel matrix.

28. (Currently Amended) The method according to ~~claim 23~~ claim 24, wherein the dendrimeric organochalcogeno derivative is covalently bound to at least a portion of the sol-gel matrix.

29. (Currently Amended) The method according to ~~claim 23~~ claim 24, wherein from about 0.1 wt.% to about 5 wt.% of the dendrimeric organochalcogeno derivative is bound to the sol-gel matrix.

30. (Currently Amended) The method according to ~~claim 20~~ claim 24, wherein the surface is selected from the group consisting of metals, plastics, glass, and wood.

31. (Currently Amended) The method according to ~~claim 20~~ claim 24, wherein applying comprises spraying, dipping, spreading, or brushing.